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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/458,235	12/09/1999	NAOHISA KAMIYAMA	0039-7451-2S	8611

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EXAMINER

JAWORSKI, FRANCIS J

ART UNIT	PAPER NUMBER
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3737

DATE MAILED: 02/12/2002

41

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/458,235

Applicant(s)

KAMIYAMA

Examiner

Jaworski Francis J.

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 13 March 2000.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-68 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 41 - 43, 45 - 49, 56 - 59, 62 and 67 - 68 is/are allowed.
- 6) ☒ Claim(s) 1 - 7, 10 - 18, 21 - 29, 31 - 33, 38 - 40, 44, 50 - 51, 53 - 55, 60 - 61, 63 - 66 is/are rejected.
- 7) ☒ Claim(s) 8 - 9, 19 - 20, 30, 34 - 37, 52 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

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Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1-2, 4-7, 10, 12, 14-18, 21- 29, 31 - 33, 38 - 39, 51, 53-55, 60 - 61, 64 - 66 are rejected under 35 U.S.C. 103(a) as being unpatentable over **Feinstein** (US4572203) in view of **Uhlendorf et al** (US5678553). Feinstein et al illustrates in the face figure a conventional approach to contrast agent imaging involving a scanning means 10 for scanning an echocardiographic cross-section including microbubble contrast agent injected via 24, 26 and an image data obtainance means 12 including an initially obtained data frame termed a 'primary image' and scan converted or stored stage (termed a memory cell matrix in the inventor's drawing) for output to a video monitor termed a TV image in that figure, for displaying a motion image of valve or cardiac wall abnormalities as per col. 5 lines 16-32. Such a system necessarily stores the image as assembled in order to scan convert from the scanner frame acquisition speed and from the sector coordinate system necessary to effect between-rib heart angled scanning to the rectilinear format and frame rate of video display in realtime or quasi-realtime, all as indicated in the Feinstein face figure. Since Uhlendorf '553 is also directed to memory-based imaging via

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contrast agents of vascular regions including the heart (col. 4 lines 37-41, and both varying power level and varying frequency are contemplated in the context of vascular imaging, see claims 71-74 thereof, one must necessarily relate Uhlendorf '553 to the application context of Feinstein, whereupon it would have been obvious to effect vascular imaging via conventional scanning system a la Feinstein but with execution of supraproportional power boosting at the time of image storage as per col. 3 line 29 - col. 4 line 36 and/or frequency lability of transmission and also including burst number selection (col. 4 lines 62 - 65) with sum/difference display production for the reasons that shadowing beyond the microbubble due to high necessitated concentrations of contrast agent under conventional single-power protocol is avoided and also materials having lower particulate concentrations such as the lymph node reticuloendothelial system may now be imaged (claims 1, 14, 29, 31 - 33, 54-55, 64 - 66). Storage of early images would be inherently obvious since contrast agent is being constantly deleted and re-circulation may obscure perfusion image quality. (Claims 4, 15, 24). Sound pressure ranges in milliPascals per col. 4 line 47 during this boosting (claims 2, 25) and is controlled by an adjustable function generator pulse amplitude as a temporary adjustable burst PRF or frequency change process per col. 4 lines 50-57 (claims 6, 7, 17-18, 26-28). The videotape option shown in Feinstein is representative of a retained or static image or image sequence (claims 5, 16). The production of a sum or high frequency in Uhlendorf et al, col. 6 lines 16-21 considered with claim 73 thereof suffices to meet claims 10, 21-22. The computation of ejection fraction called for in Feinstein col. 5 lines 27-30 requires computing the max/min densities with time of aggregate pixels selected as within the ventricular blood pool

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volume (claims 12, 23). A high pass filter or supra-harmonic filter is included within the meaning of the frequency band processing of Fig. 10. (Claims 38, 53). Manual initiation of brighten-up would be inherently obvious since one must wait until the contrast agent is introduced in order to effectively use this mode. (Claim 39).

3. Claims 3, 11, 13, 50 are rejected under 35 U.S.C. 103(a) as being unpatentable over Feinstein in view of Uhlendorf as applied to claim 1 above, and further in view of **Deitrich** (US5482046) insofar as the latter evidences that since the piezoelectric effect is exercised via high voltage application to the array element electrodes, power application agility as called for in Uhlendorf et al is necessarily mediated by control of high voltage amplitudes delivered to the elements, see element 24 and col. 12 lines 35-45 (a pulsar power amplifier may have a high current draw in order to up its output and therefore be referenced to in terms of power or amplitude but in the end it is application voltage level uppage to the transducer electrodes that causes the boost called for in Uhlendorf et al. (Claim 3) A power display such as 18 thereof would be obvious in order not to exceed cavitation thresholds (claim 11). Such distributed power control requires a severality of means which may be said to be associated with respective delivered powers (claim 13).

4. Claims 40/ (29, 31 - 33, 38 - 39) and claims 44, 63 are rejected under 35 U.S.C. 103(a) as being unpatentable over Feinstein in view of Uhlendorf et al as applied to claims above, and further in view of Monaghan (US5255683) which evidences the obviousness of using an EKG

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trigger 36 to time contrast agent image acquisitions in order to obtain cardiac-cycle related parameters such as the ejection fraction called for in Feinstein..

5. Claims 8 - 9, 19-20, 30, 34 - 37, 40/(30, 34 - 37) and 51 - 52 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

6. Claims 41 - 43, 45 - 49, 56 - 59 and 62, 67 - 68 are allowable over the prior art.


7.

The original patent must be surrendered, see MPEP Section 1416, or an affidavit proffered averring to its loss or inaccessibility provided.

Any inquiry concerning this communication should be directed to Examiner Francis J. Jaworski at telephone number (703) 308-3061.

FJJ:fjj

1-12-02


Francis J. Jaworski
Primary Examiner

Attachment for PTO-948 (Rev. 03/01, or earlier)

6/18/01

The below text replaces the pre-printed text under the heading, "Information on How to Effect Drawing Changes," on the back of the PTO-948 (Rev. 03/01, or earlier) form.

INFORMATION ON HOW TO EFFECT DRAWING CHANGES

1. Correction of Informalities -- 37 CFR 1.85

New corrected drawings must be filed with the changes incorporated therein. Identifying indicia, if provided, should include the title of the invention, inventor's name, and application number, or docket number (if any) if an application number has not been assigned to the application. If this information is provided, it must be placed on the front of each sheet and centered within the top margin. If corrected drawings are required in a Notice of Allowability (PTOL-37), the new drawings **MUST** be filed within the **THREE MONTH** shortened statutory period set for reply in the Notice of Allowability. Extensions of time may **NOT** be obtained under the provisions of 37 CFR 1.136(a) or (b) for filing the corrected drawings after the mailing of a Notice of Allowability. The drawings should be filed as a separate paper with a transmittal letter addressed to the Official Draftsperson.

2. Corrections other than Informalities Noted by Draftsperson on form PTO-948.

All changes to the drawings, other than informalities noted by the Draftsperson, **MUST** be made in the same manner as above except that, normally, a highlighted (preferably red ink) sketch of the changes to be incorporated into the new drawings **MUST** be approved by the examiner before the application will be allowed. No changes will be permitted to be made other than correction of informalities, unless the examiner has approved the proposed changes.

Timing of Corrections

Applicant is required to submit the drawing corrections within the time period set in the attached Office communication. See 37 CFR 1.85(a).

Failure to take corrective action within the set period will result in **ABANDONMENT** of the application.